SEATTLE CITY LIGHT

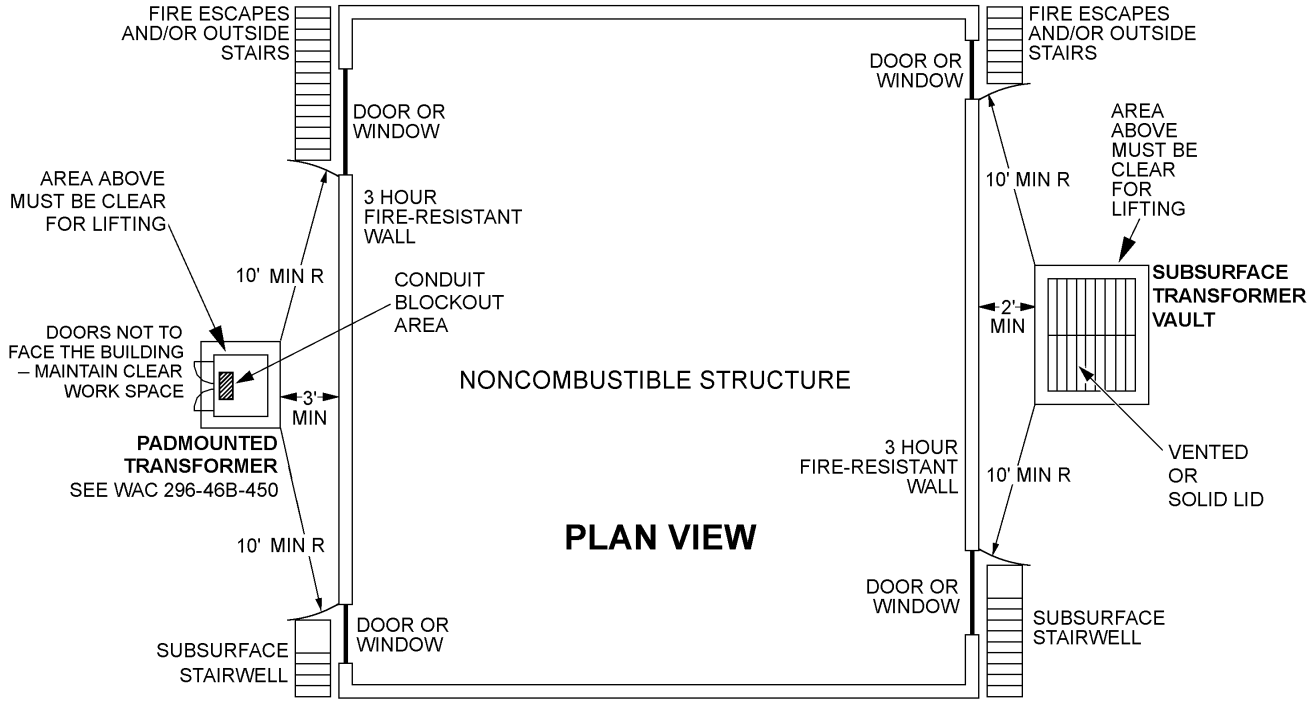
CONSTRUCTION GUIDELINE

STANDARD NUMBER: **U10-2**
PAGE: 1 of 3
SUPERCEDING: June 23, 2004
EFFECTIVE DATE: May 23, 2005

TRANSFORMER SERVICE VAULTS AND PADMOUNTS
CUSTOMER'S RESPONSIBILITY - OUTSIDE NETWORK AREA

1. **Requirements and Codes:** When the customer is required to furnish a transformer vault, as required in "Requirements for Electrical Service Connection and Electrical Rate Ordinance," the vault shall be constructed and vented in accordance with the latest editions of the National Electrical Code, Article 450, and the Seattle Building Code Section 414 "Transformer Vaults" and Appendix Chapter 4, Division IV, Section 436 "Utility Transformer Vaults." Floors, walls and ceilings/lids of vaults shall have at least a three-hour fire-resistive rating and shall be constructed of solid concrete or concrete-filled concrete masonry units at least 6 inches thick. Vault floors shall be smooth with no pads. All work, including shoring and bracing, shall be in compliance with the latest editions of the State of Washington Department of Labor and Industries Chapter 296-155 WAC "Safety Standards for Construction Work" and the Seattle Board of Public Works "Street and Sidewalk Pavement Openings and Restoration Rules." The vault location shall conform to the clearances shown in this Guideline. These required clearances may exceed the minimums shown in the latest edition of WAC 296-46B-450 “Equipment for General Use – Transformers and Transformer Vaults.” The vault size, ventilation, access, and grounding shall be approved by Seattle City Light. No sprinklers shall be allowed in vaults.

Clearances of Vaults and Padmounted Enclosures from Buildings – Noncombustible Structures
(Structures Designed to Resist Fire for Three Hours)



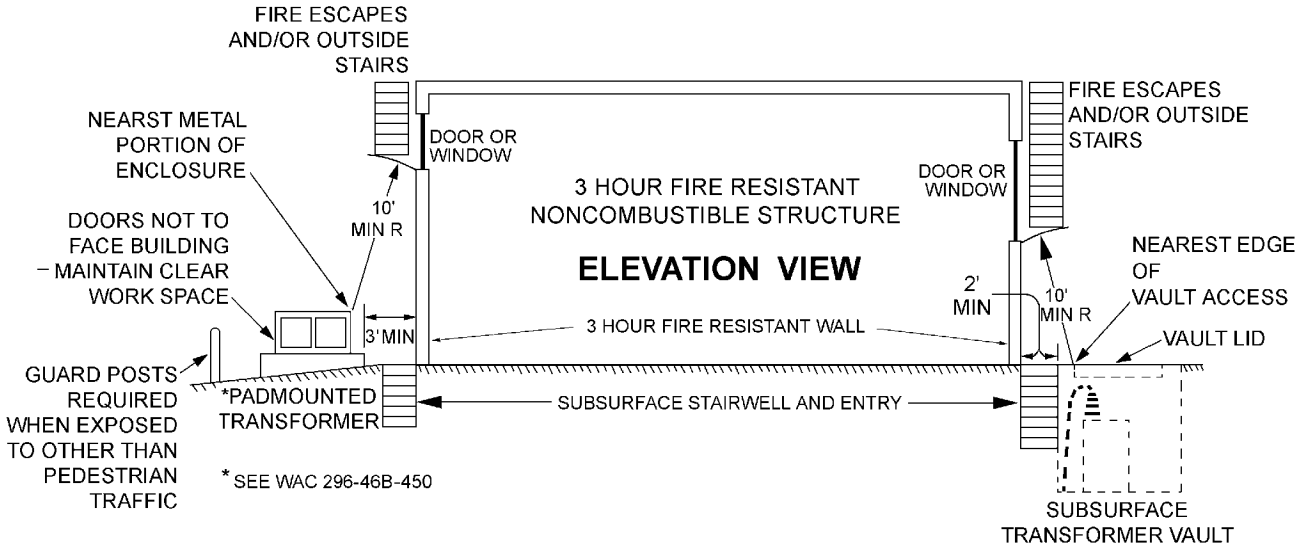
Padmount Transformer Doors Not to Face Building – Maintain Clear Work Space

STANDARDS COORDINATOR	STANDARDS SUPERVISOR	UNIT DIRECTOR

Clearances of Vaults and Padmounted Enclosures from Buildings

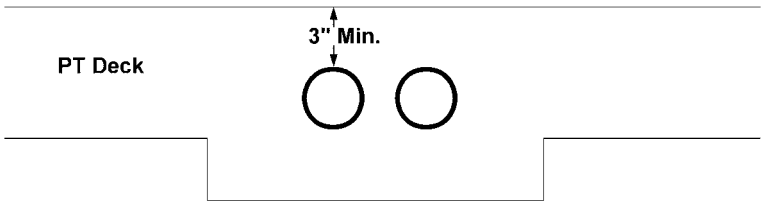
Noncombustible Structures Continued

(Combustible Structures, See Page 3)



2. **Vault Lighting:** For vaults within a building, the customer shall install lights and receptacles per Construction Guideline U10-6. For below grade vaults outside buildings, lights and receptacles shall be installed by the customer only when designated by City Light.

3. **Primary Conduit:** The customer shall furnish and install one conduit from the vault floor or wall to a point one conduit length up the utility pole per Construction Guideline U7-10.2. When the designated pole is on the opposite side of the street, the conduit shall be installed from the vault to the property line, or to a point in the right-of-way beyond obstructions. The conduit size and location shall be designated by City Light. Conduit beneath a building floor slab shall be rigid galvanized steel. Customer furnished duct banks running inside floor slabs such as post tension (PT) decks must be encased in concrete all along the course of the duct bank to ensure concrete embedment on all four sides of no less than three inches. The conduits must be separated from each other by a minimum of two inches of concrete. Tray size shall be adequate to clear all PT cables.



4-Inch Rigid Steel Conduit
Inside PT Deck with 3-Inch
Embedment
Tray Depth as Required

4. **Secondary Bus Duct:** If the customer installs bus duct, it shall extend approximately 18" into the vault, location to be approved by Seattle City Light prior to installation. The customer shall drill the bus for the number of connectors designated by City Light. The holes shall have NEMA spacing, 1-3/4" center to center, for 1/2" bolts (9/16" holes). The connectors will be furnished by City Light.

5. **Secondary with Conduit and Cable:** If the customer installs conduit instead of bus duct, the customer shall furnish and install phase and neutral conductors of sufficient length to connect to the transformer terminals. The conduit location shall be designated by City Light. If more than four conductors per phase and neutral are installed, the customer may be required to provide a suitable tap box or collector bus in the vault with compression-type connectors on the bus of the size, type and number designated by City Light.

6. **Fire Protection:** The customer shall furnish and install fire stop insulating material per NEC requirements for service conduits (Note 5) and service bus duct (Note 4) installed by the customer. Prior to acceptance of the vault by City Light, the customer shall have the fire protection material inspected and approved by the local building department or the appropriate building inspection agency. It should be the customer's responsibility to assure that water does not enter the building and does not enter service entrance equipment from City Light vaults.

7. **Ground Rods:** The customer shall furnish and install two 5/8" x 8' copperclad steel sectional ground rods in opposite corners of the vault. The rods shall protrude approximately 6" above the finished floor. A driving head shall be used to prevent damage to the ground rod threads. The space between the rods and the floor shall be caulked and grouted to prevent the entrance of water.

   Occasionally, due to poor ground conditions on very large transformers, multiple transformer installations, or high fault duties, the customer will be required to install more ground rods as designated by City Light.

   Where vaults are on upper floors, four ground rods shall be driven below ground level eight feet apart. A ground wire shall be connected to the ground rods and run into the vault and affixed to three walls of the vault approximately 18" above the floor. The size of the wire shall be determined by the National Electrical Code and shall be of adequate size to carry the available fault current.

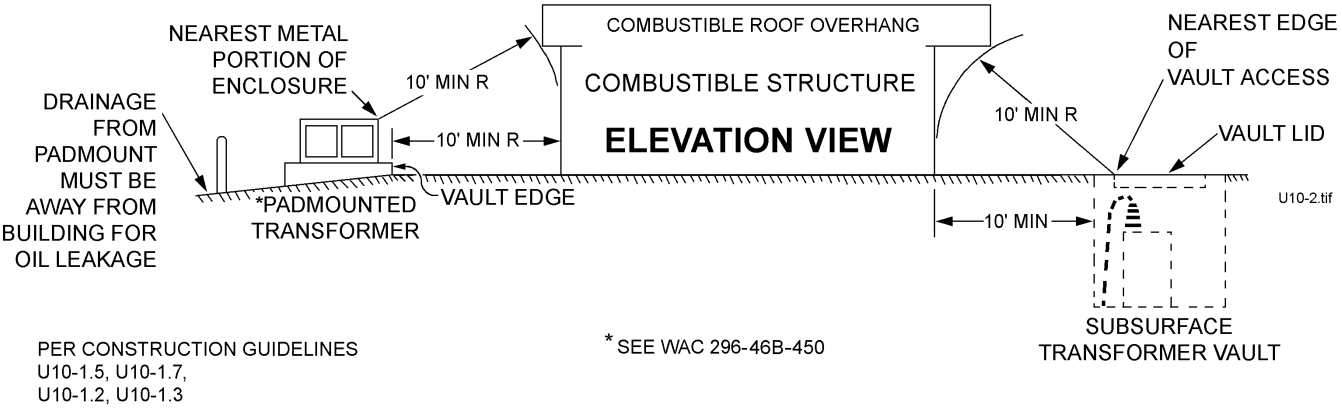
   If grounding is under concrete or asphalt, all connections shall be done by exothermic welding (Cadweld or better).

8. **Doors and Lock:** Vault doors shall swing out and be equipped with panic bars, pressure plates, or other devices that are normally latched but open under simple pressure (Ref. NESC Rule 113C). The exit devices must be always locked (storeroom function) and equipped with a cylinder which accepts a Best Universal Lock Co. core. The core will be provided and installed by Seattle City Light. Doors on padmounted installations shall not face the building to insure an adequate work area is maintained.

9. **Sump pump Discharge:** For below grade vaults, the customer shall furnish and install one 2" PVC, Schedule 40, pipe through the ceiling or high through the wall and into the nearest storm drain. The pipe shall extend a minimum of 4" into the vault.

Clearances of Vaults and Padmounted Enclosures from Buildings

Combustible Structures



PER CONSTRUCTION GUIDELINES
U10-1.5, U10-1.7,
U10-1.2, U10-1.3

* SEE WAC 296-46B-450